(3) There is full reflection by water on all sides, as close as is consistent with the damaged condition of the package.

[60 FR 50264, Sept. 28, 1995; 61 FR 28724, June 6, 1996]

§ 71.57 [Reserved]

§ 71.59 Standards for arrays of fissile material packages.

(a) A fissile material package must be controlled by either the shipper or the carrier during transport to assure that an array of such packages remains subcritical. To enable this control, the designer of a fissile material package shall derive a number ''N'' based on all the following conditions being satisfied, assuming packages are stacked together in any arrangement and with close full reflection on all sides of the stack by water:

(1) Five times ''N'' undamaged packages with nothing between the packages would be subcritical;

(2) Two times ''N'' damaged packages, if each package were subjected to the tests specified in §71.73 (''Hypothetical accident conditions'') would be subcritical with optimum interspersed hydrogenous moderation; and

(3) The value of ''N'' cannot be less than 0.5.

(b) The transport index based on nuclear criticality control must be obtained by dividing the number 50 by the value of ''N'' derived using the procedures specified in paragraph (a) of this section. The value of the transport index for nuclear criticality control may be zero provided that an unlimited number of packages is subcritical such that the value of ''N'' is effectively equal to infinity under the procedures specified in paragraph (a) of this section. Any transport index greater than zero must be rounded up to the first decimal place.

(c) Where a fissile material package is assigned a nuclear criticality control transport index—

(1) Not in excess of 10, that package may be shipped by any carrier, and that carrier provides adequate criticality control by limiting the sum of the transport indexes to 50 in a non-exclusive use vehicle, and to 100 in an exclusive use vehicle.

(2) In excess of 10, that package may only be shipped by exclusive use vehicle or other shipper controlled system specified by DOT for fissile material packages. The shipper provides adequate criticality control by limiting the sum of the transport indexes to 100 in an exclusive use vehicle.

§ 71.61 Special requirement for irradiated nuclear fuel shipments.

A package for irradiated nuclear fuel with activity greater than 37 PBq (10^6 Ci) must be so designed that its undamaged containment system can withstand an external water pressure of 2 MPa (290 psi) for a period of not less than one hour without collapse, buckling, or inleakage of water.

§ 71.63 Special requirements for plutonium shipments.

(a) Plutonium in excess of 20 Ci (0.74 TBq) per package must be shipped as a solid.

(b) Plutonium in excess of 20 Ci (0.74 TBq) per package must be packaged in a separate inner container placed within outer packaging that meets the requirements of subparts E and F of this part for packaging of material in normal form. If the entire package is subjected to the tests specified in §71.71 (''Normal conditions of transport''), the separate inner container must not release plutonium as demonstrated to a sensitivity of 10^{-6} A_2/h. If the entire package is subjected to the tests specified in §71.73 (''Hypothetical accident conditions''), the separate inner container must restrict the loss of plutonium to not more than A_2 in 1 week. Solid plutonium in the following forms is exempt from the requirements of this paragraph:

(1) Reactor fuel elements;

(2) Metal or metal alloy; and

(3) Other plutonium bearing solids that the Commission determines should be exempt from the requirements of this section.

§ 71.64 Special requirements for plutonium air shipments.

(a) A package for the shipment of plutonium by air subject to §71.88(a)(4), in addition to satisfying the requirements of §§71.41 through 71.63, as applicable, must be designed, constructed,